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**Beng Keong et al.**

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(54) **WICKING ACCUMULATED INK AWAY FROM OPTICAL SENSOR IN INKJET PRINTER**

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**B41J 29/38** (2006.01)  
**B41J 2/205** (2006.01)  
**B41J 2/165** (2006.01)

(52) **U.S. Cl.**  
USPC ..... **347/19; 347/14; 347/15; 347/22; 347/29**

(58) **Field of Classification Search**  
USPC ..... 347/14, 15, 19, 6, 22, 29  
See application file for complete search history.

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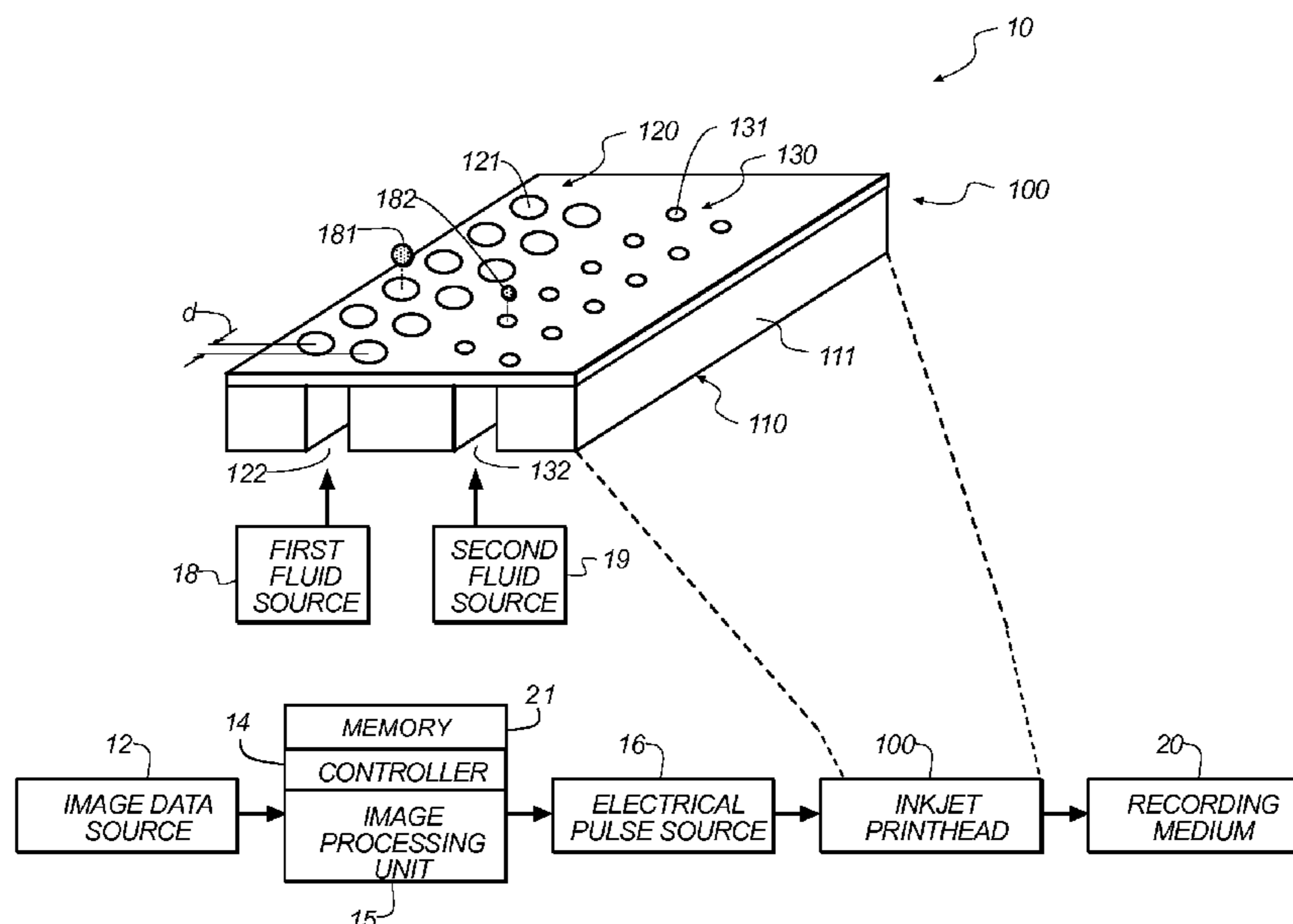
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(57) **ABSTRACT**

An inkjet printer includes an inkjet printhead having a print-head die with an array of nozzles, and a media advance system for moving recording medium along a media path toward a print region. A carriage moves the inkjet printhead back and forth across the print region, and the carriage includes a holding receptacle for the inkjet printhead. The holding receptacle includes a bottom portion having an opening into which the printhead die extends. A viewing hole is disposed in the bottom portion of the holding receptacle for providing an optical pathway between an optical sensor and a portion of the media path. A wick is configured to contact the bottom portion of the holding receptacle proximate the viewing hole for removing accumulated ink.

**13 Claims, 17 Drawing Sheets**



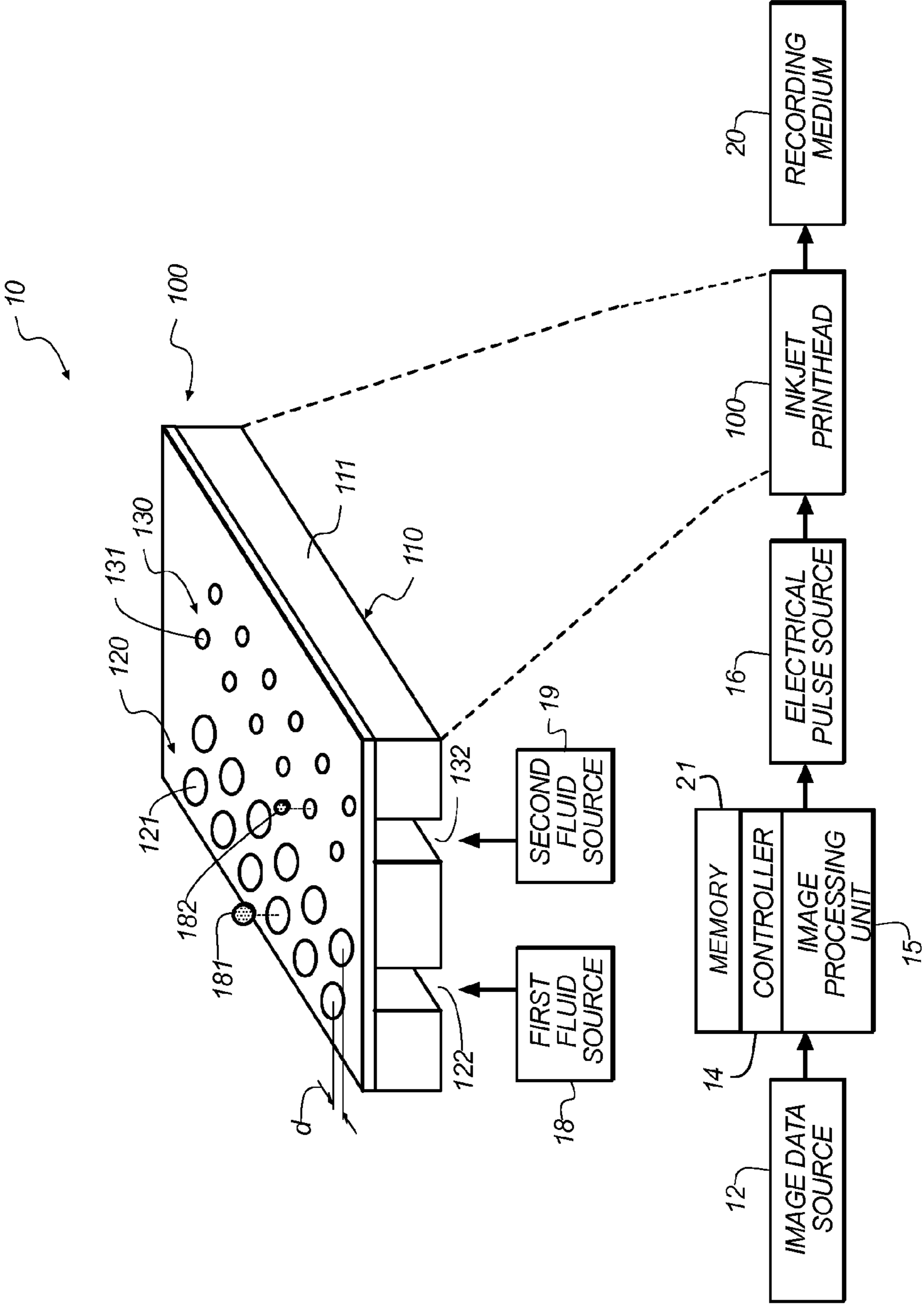


FIG. 1

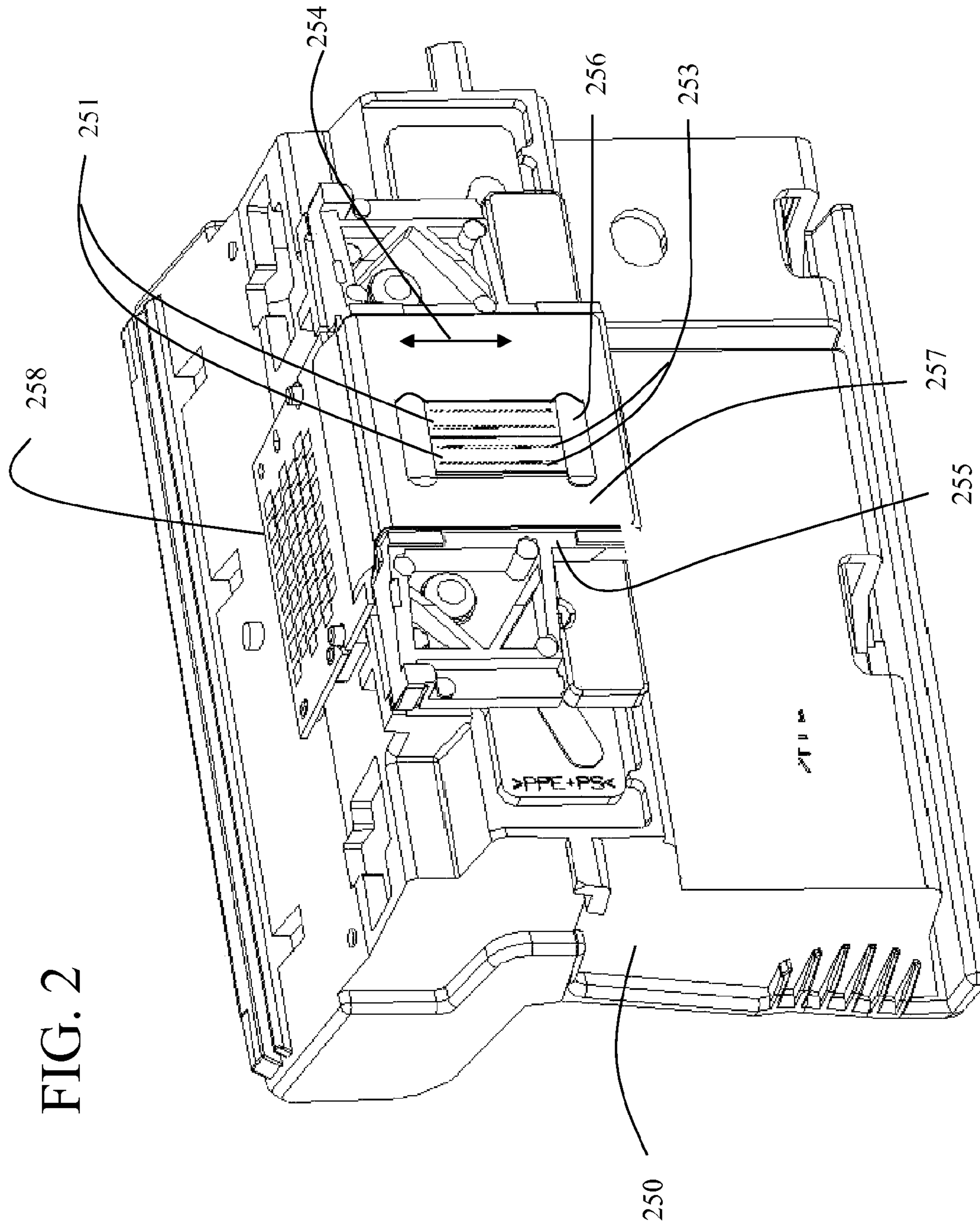


FIG. 2



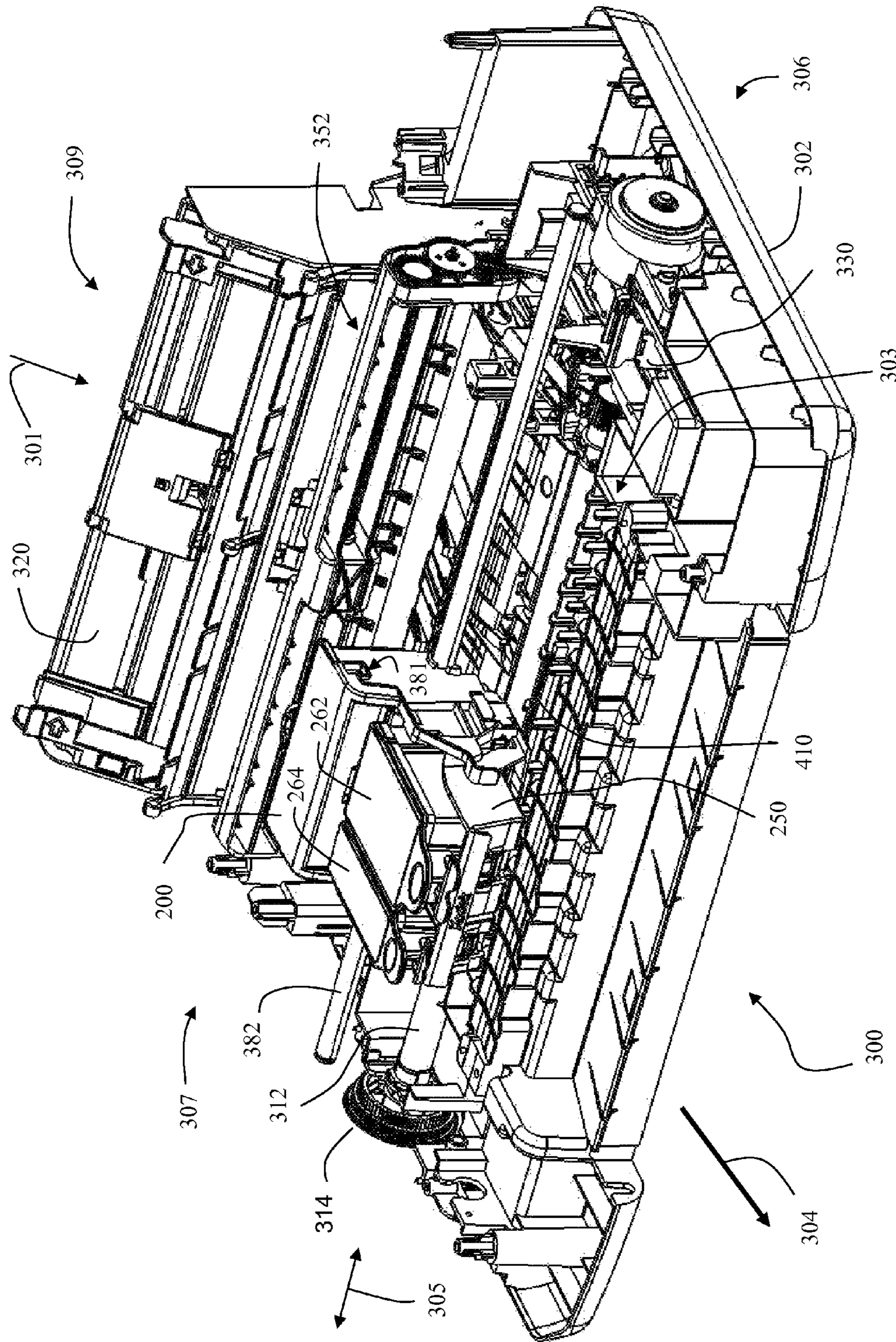


FIG. 3

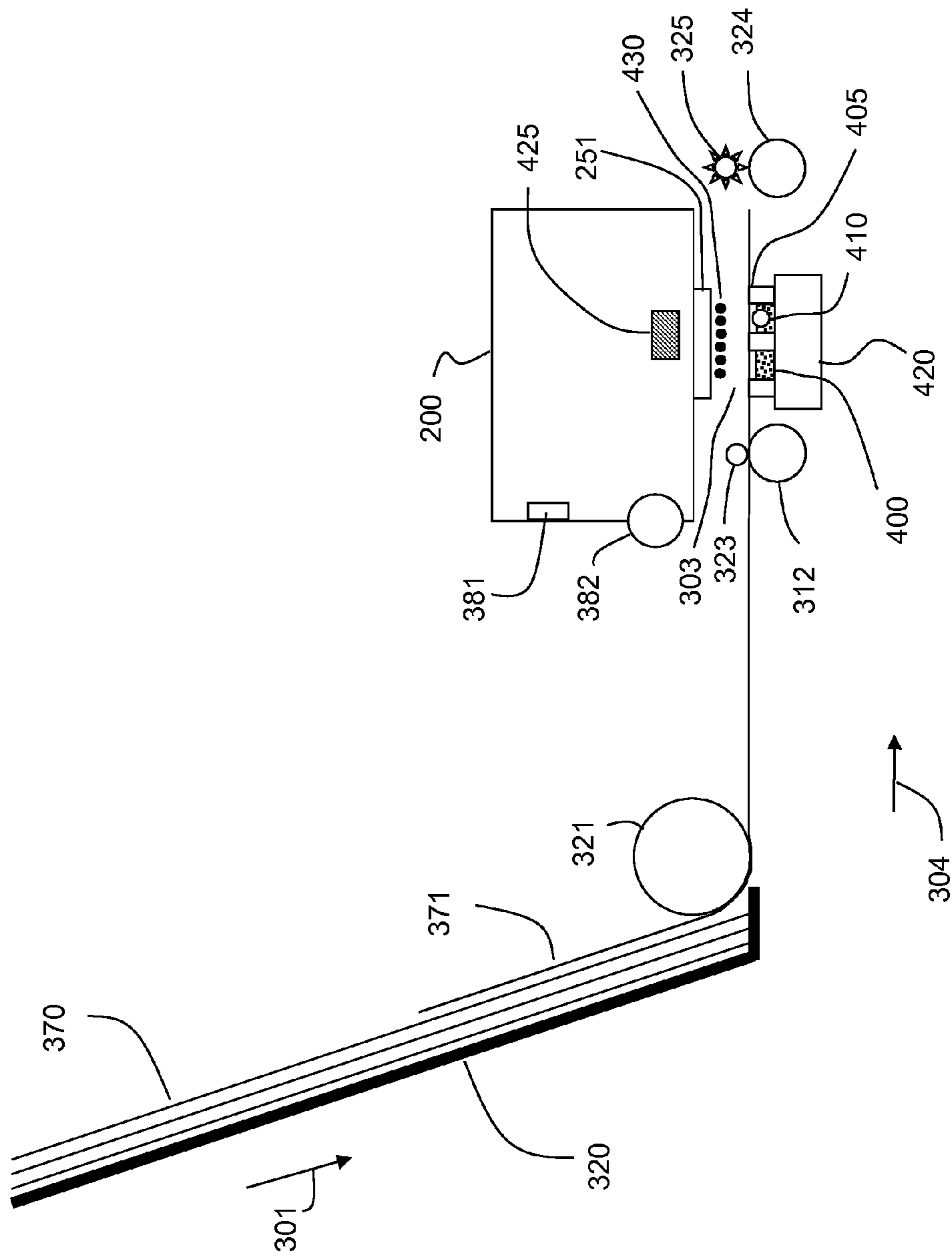


FIG. 4

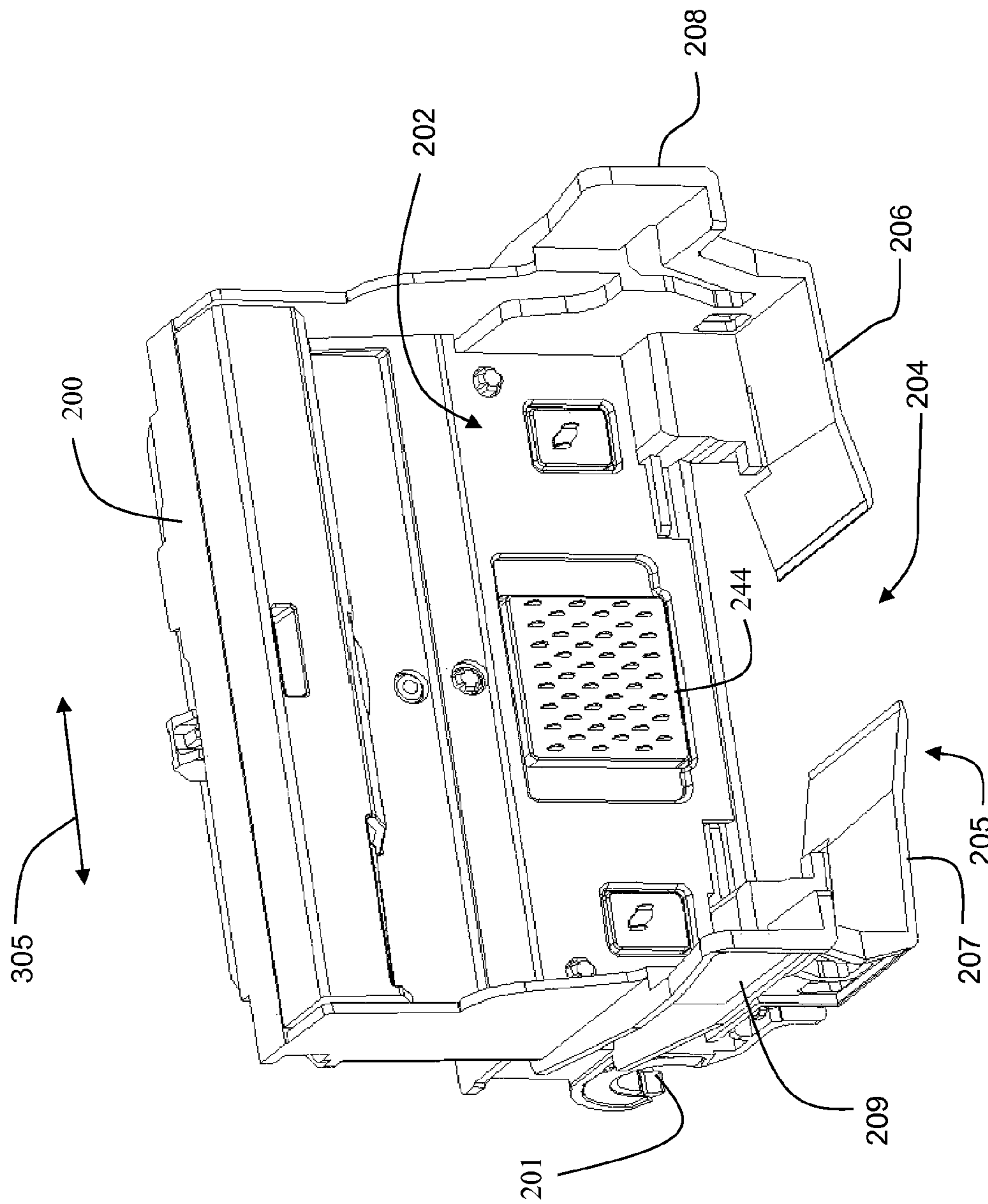


FIG. 5

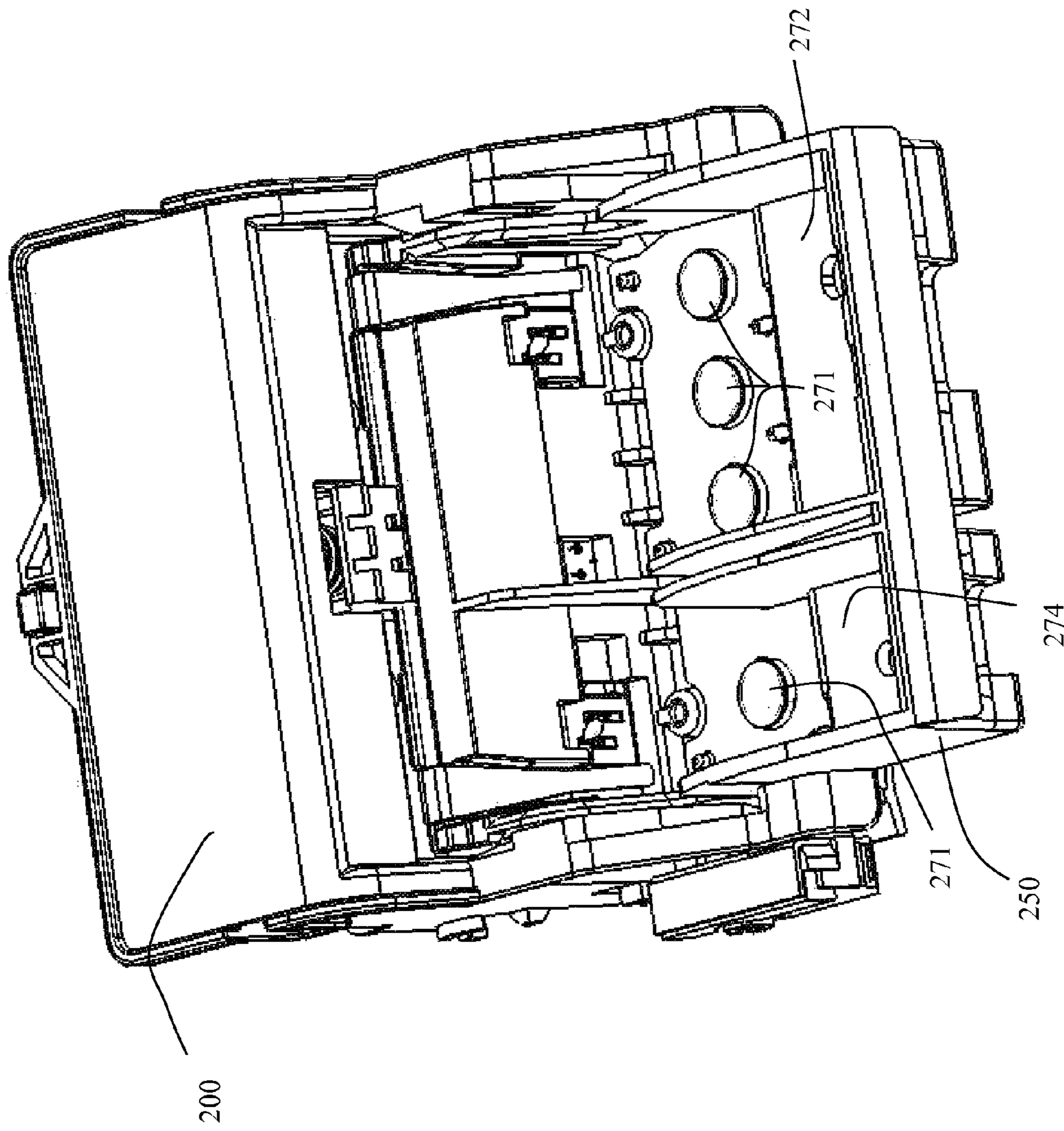


FIG. 6



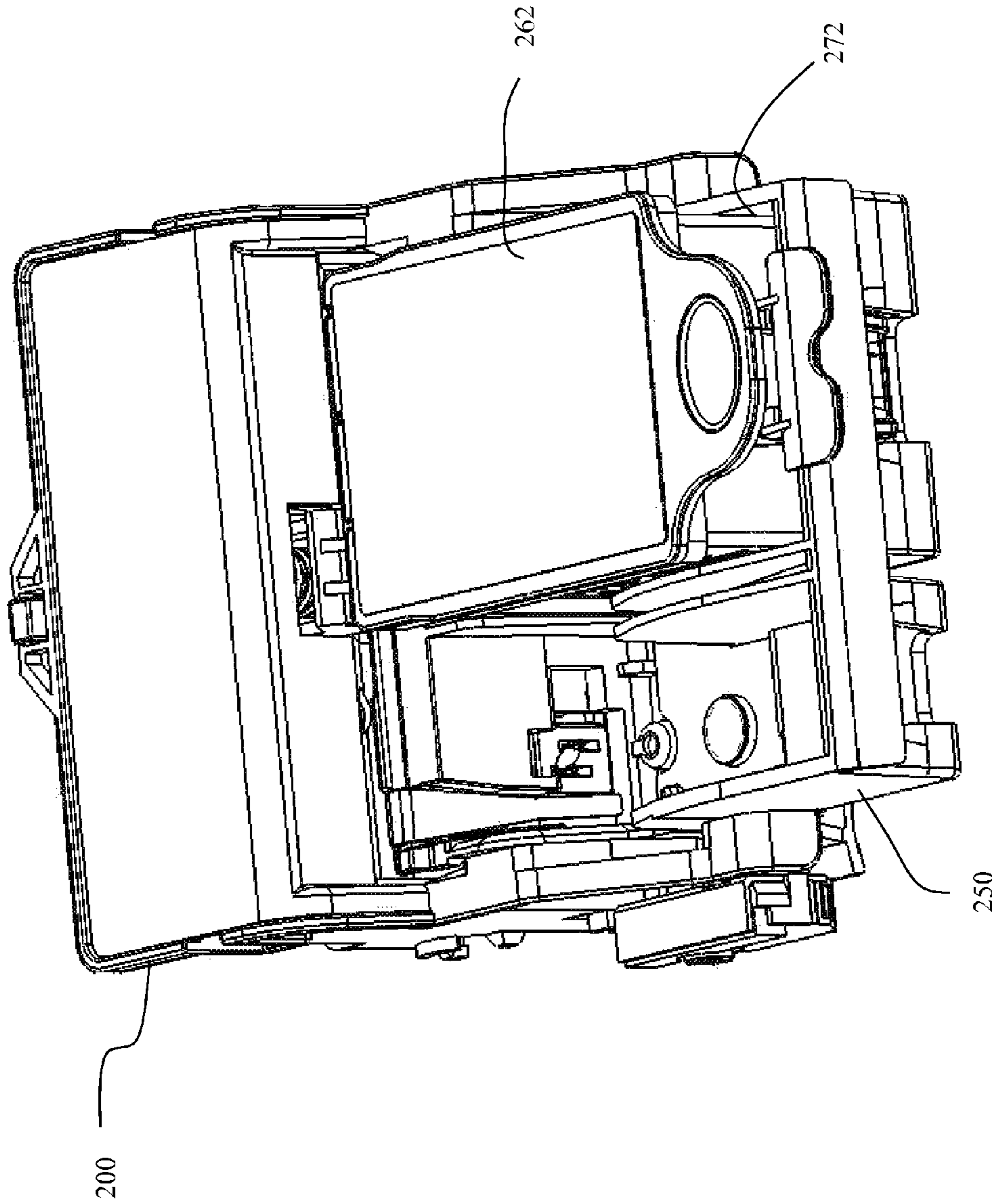


FIG. 7



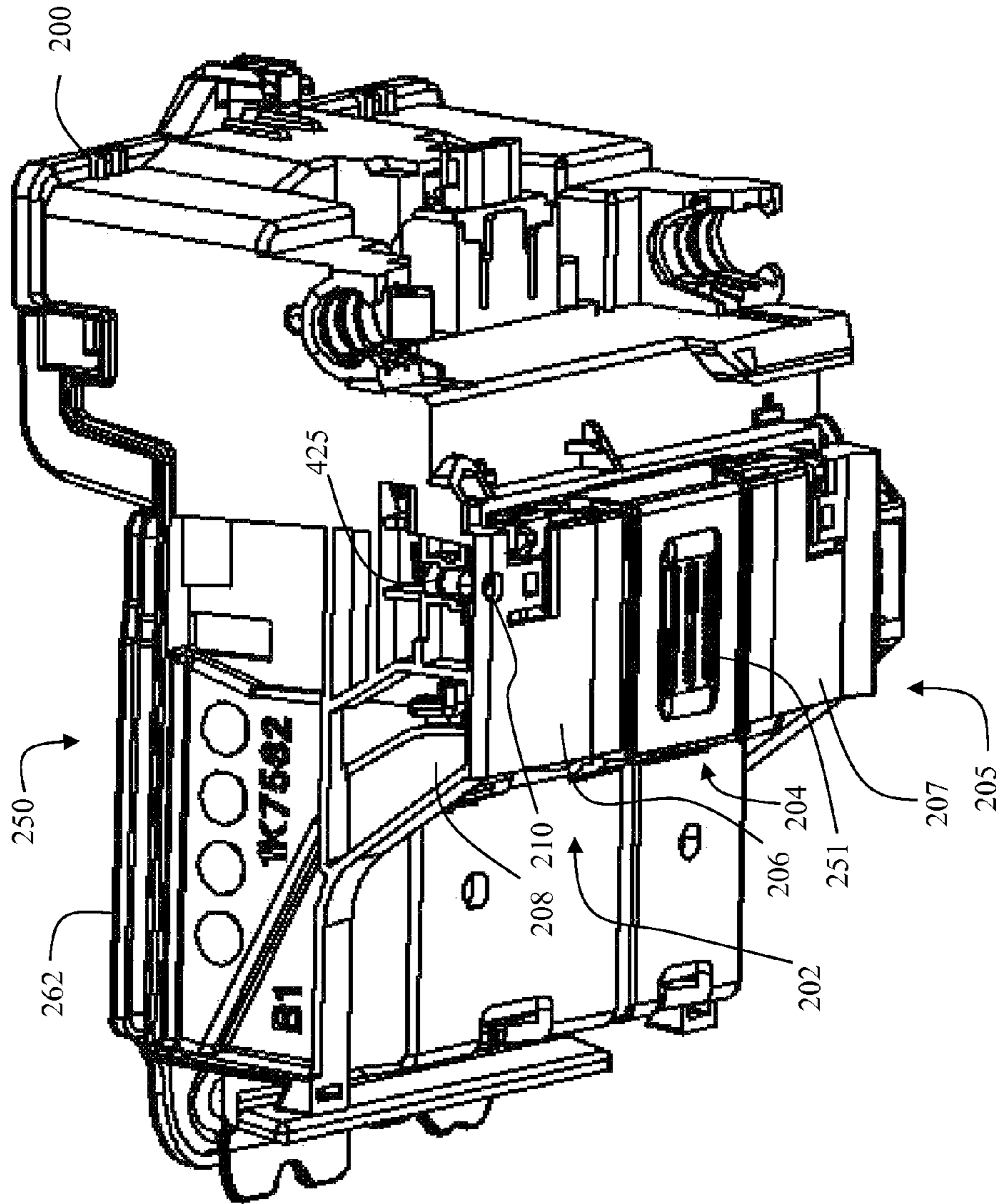


FIG. 8

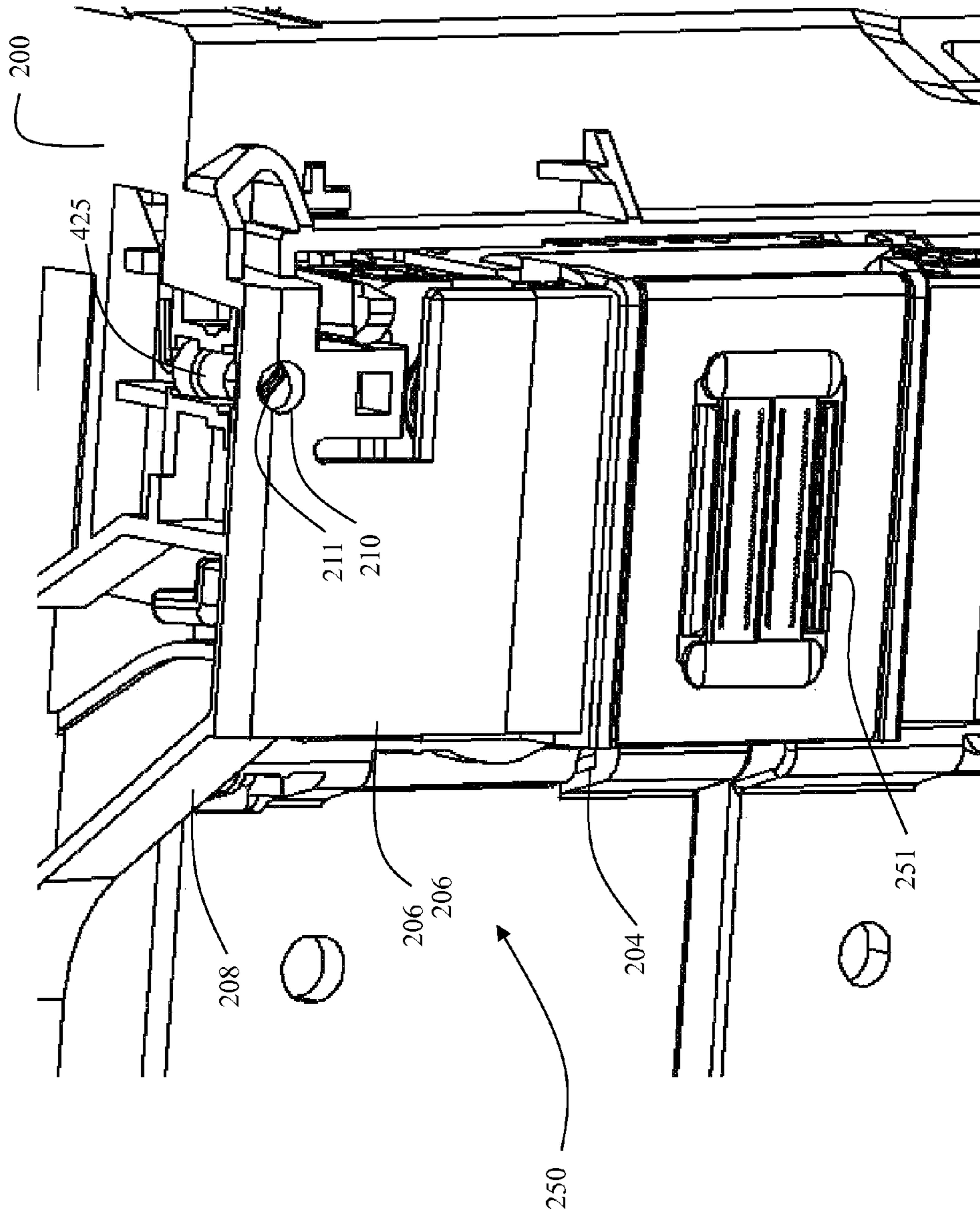


FIG. 9

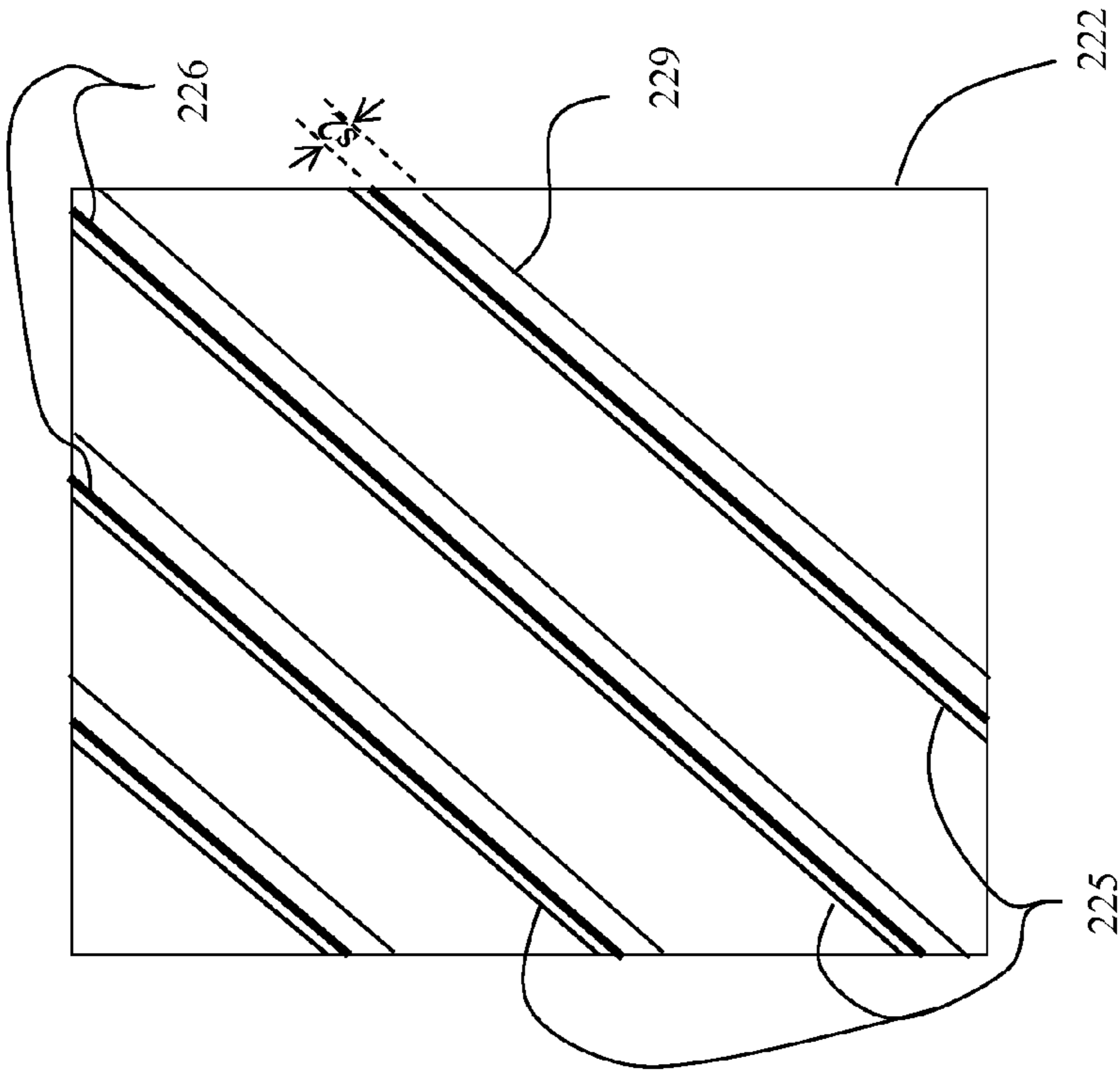


FIG. 10A

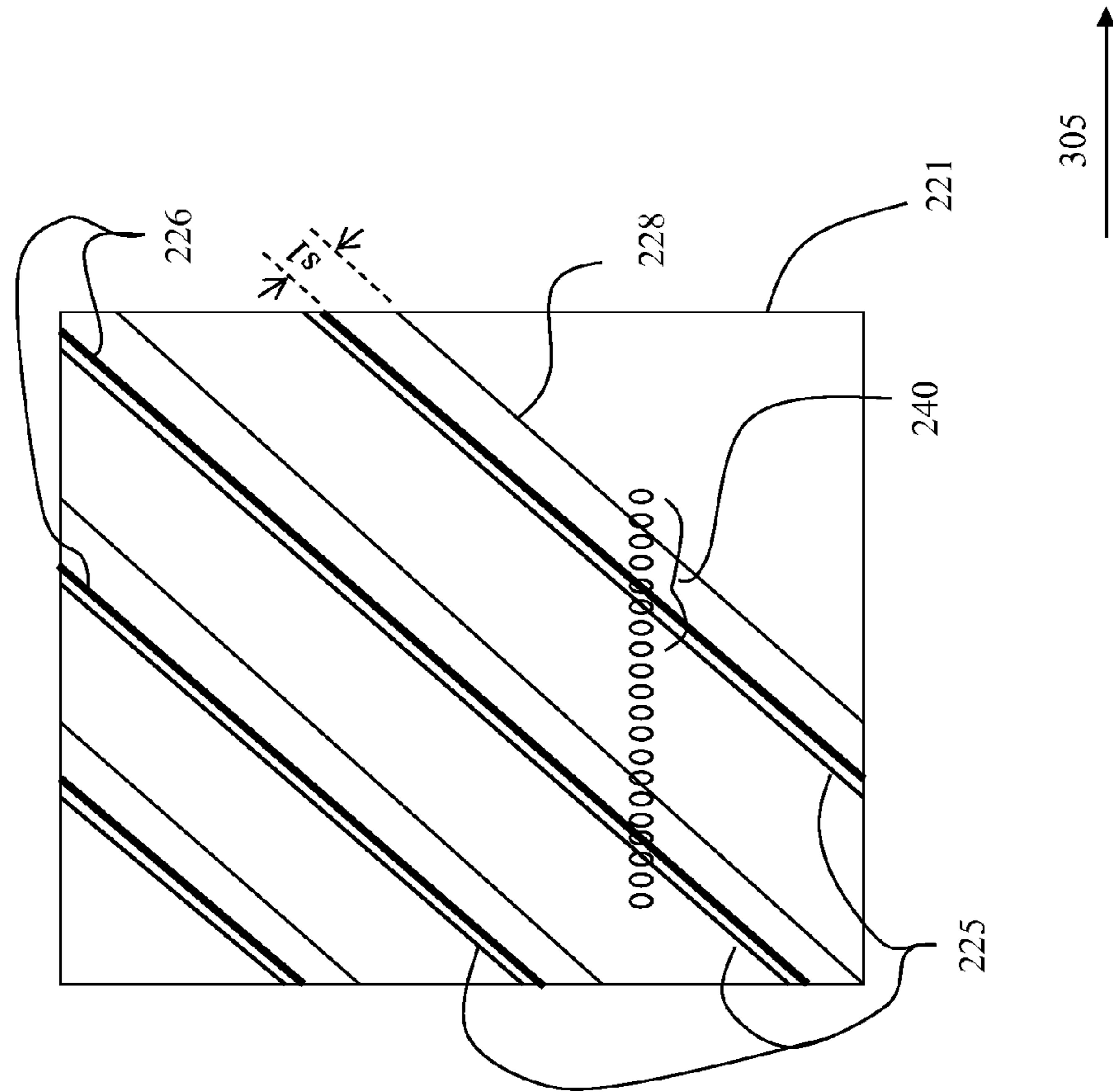


FIG. 10B

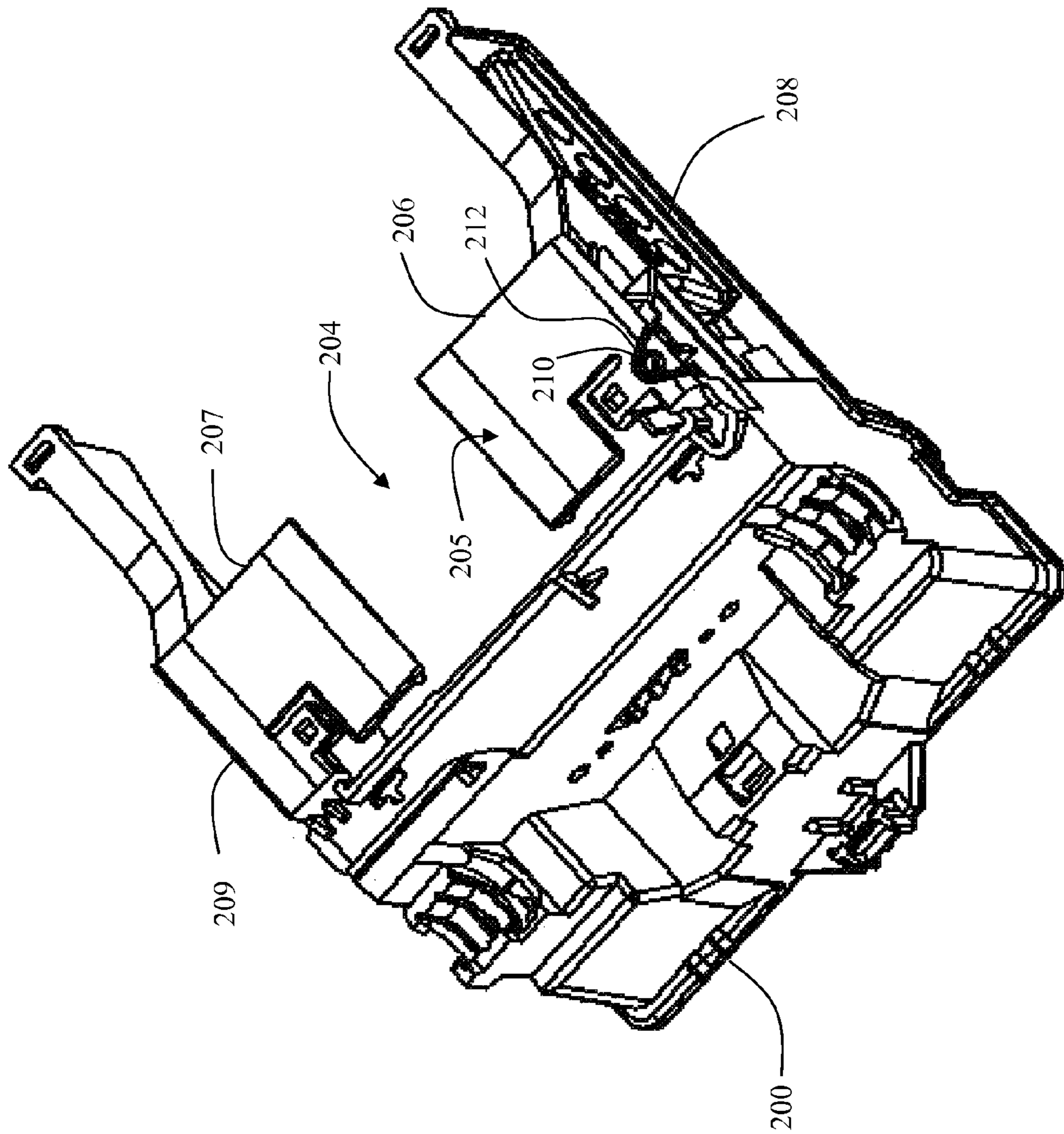


FIG. 11



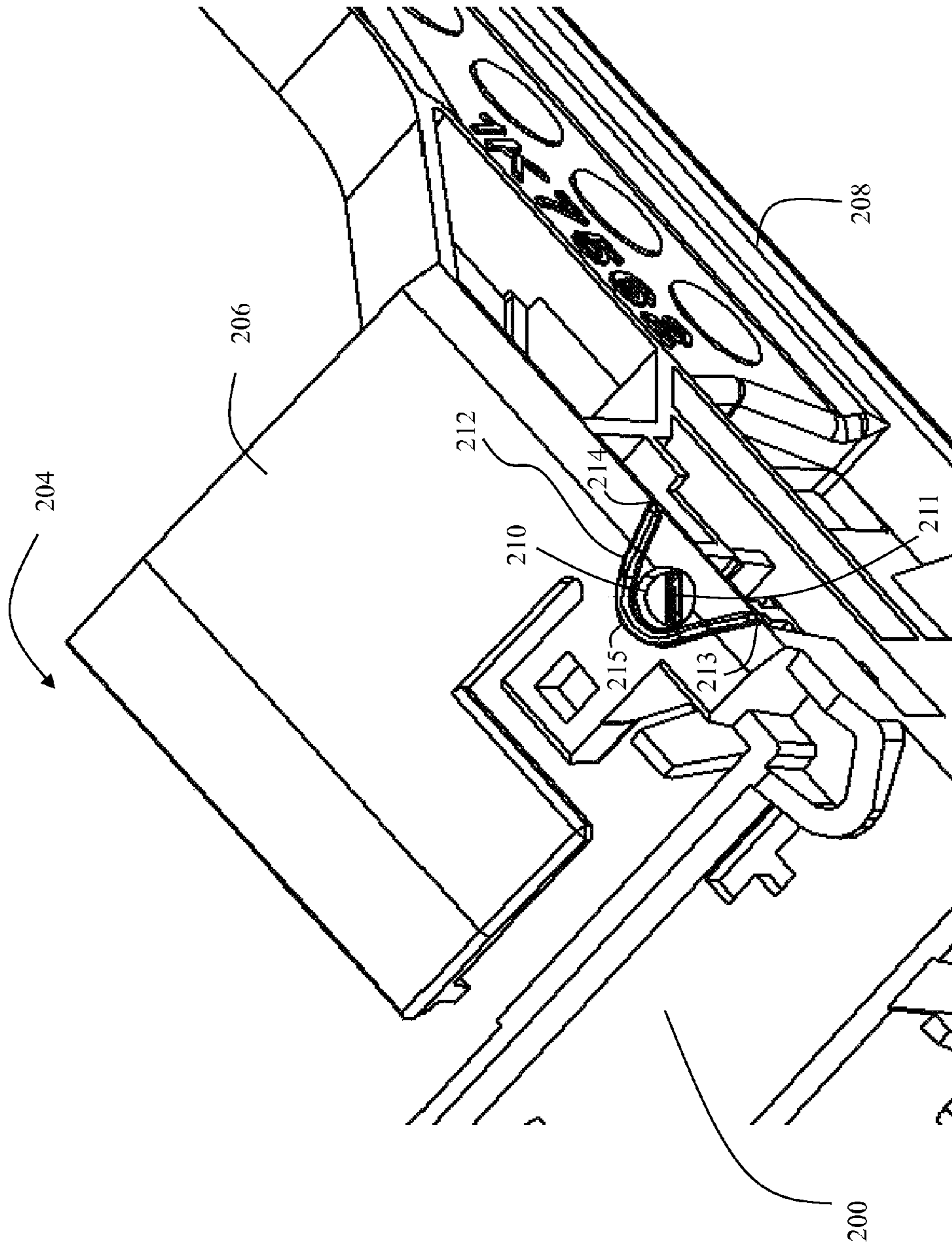


FIG. 12

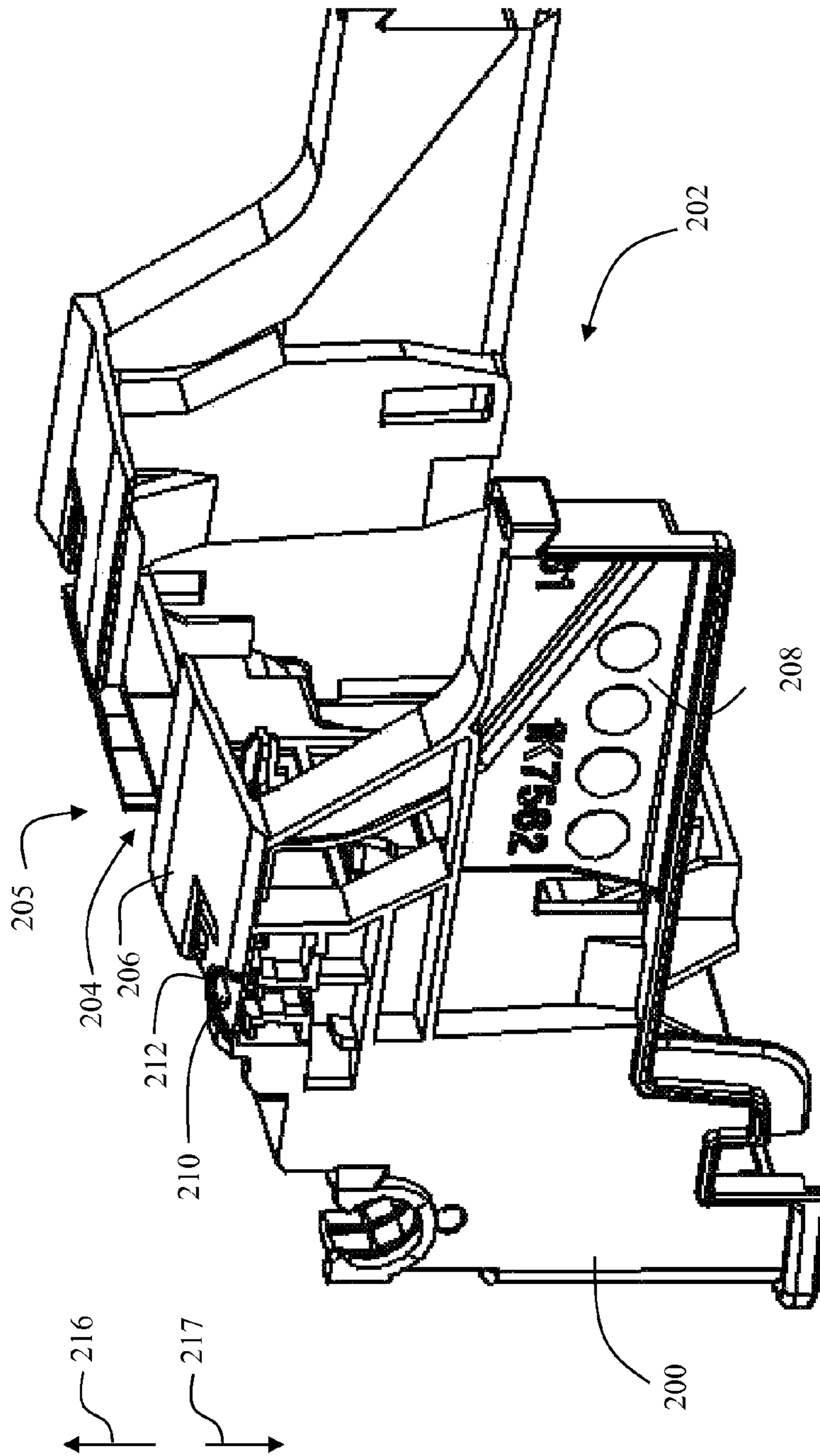


FIG. 13

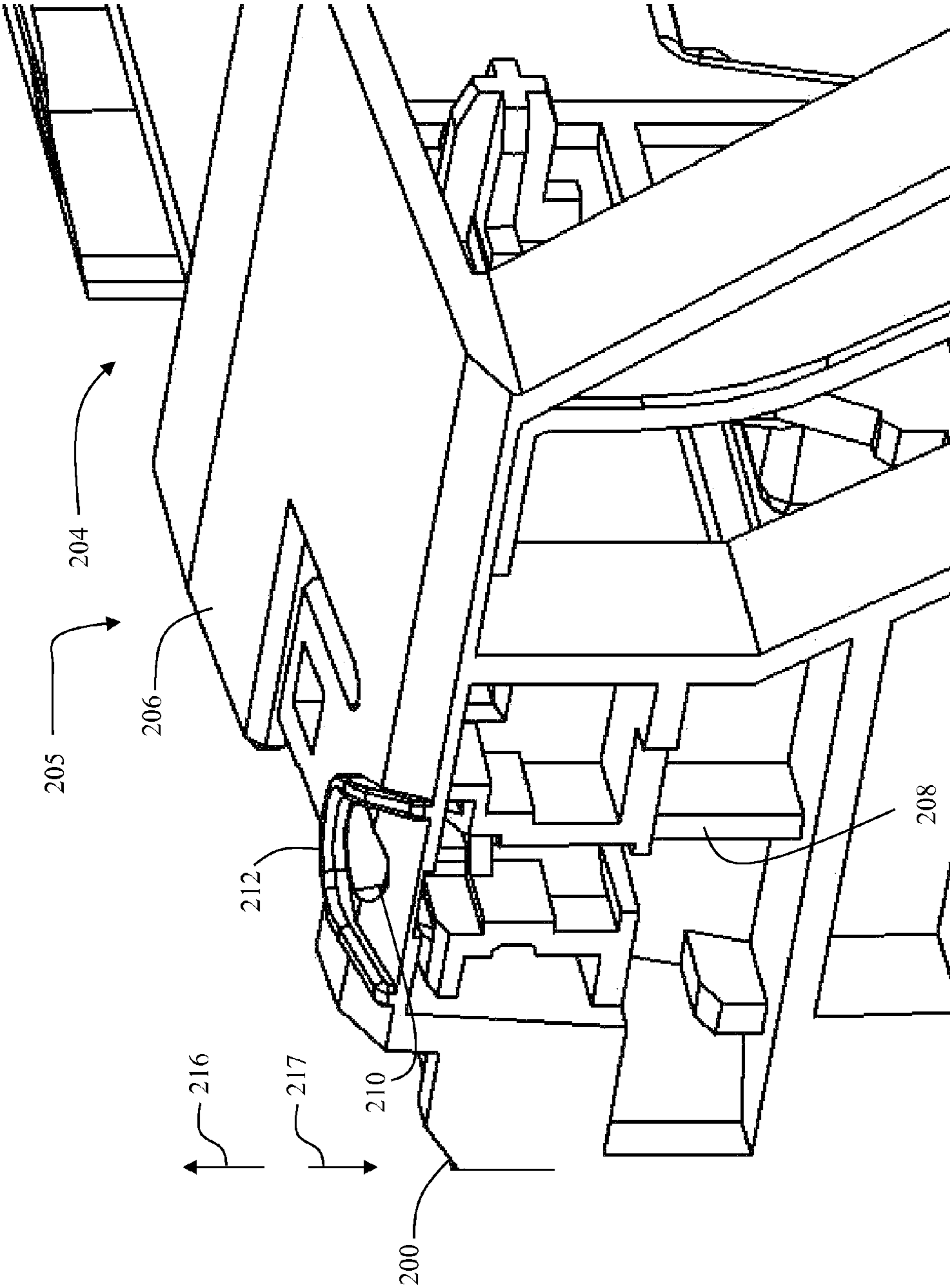


FIG. 14

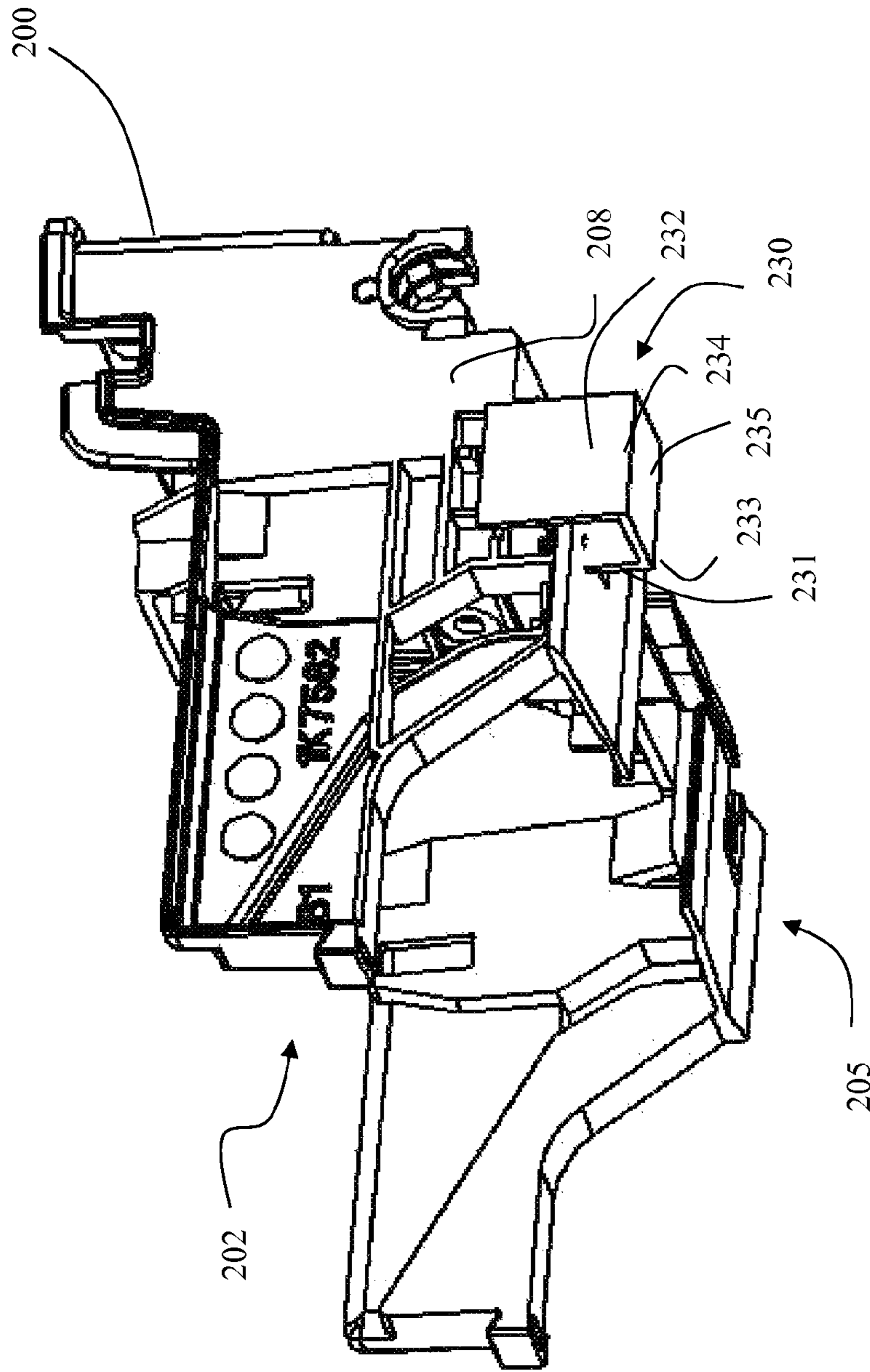


FIG. 15



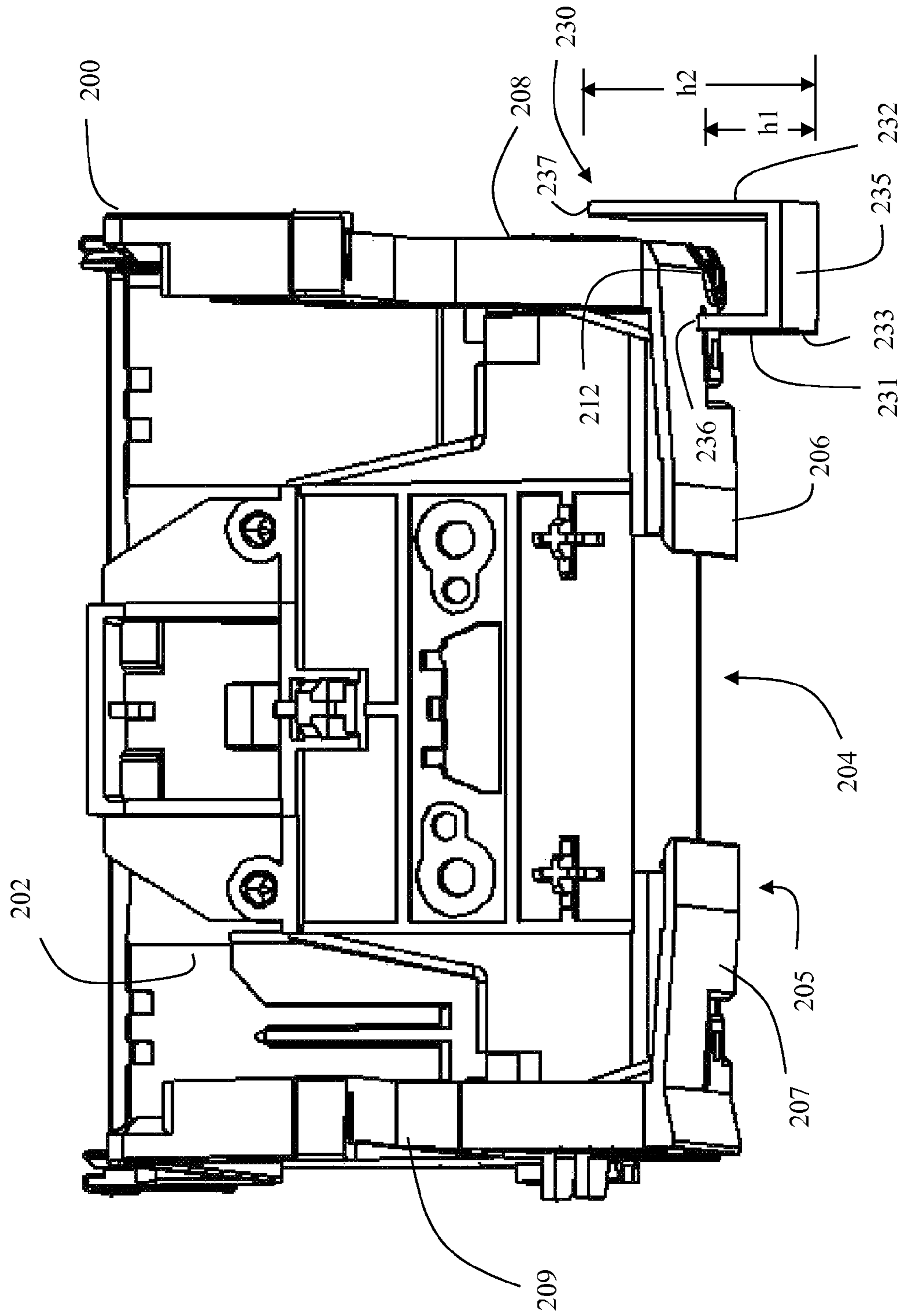


FIG. 16

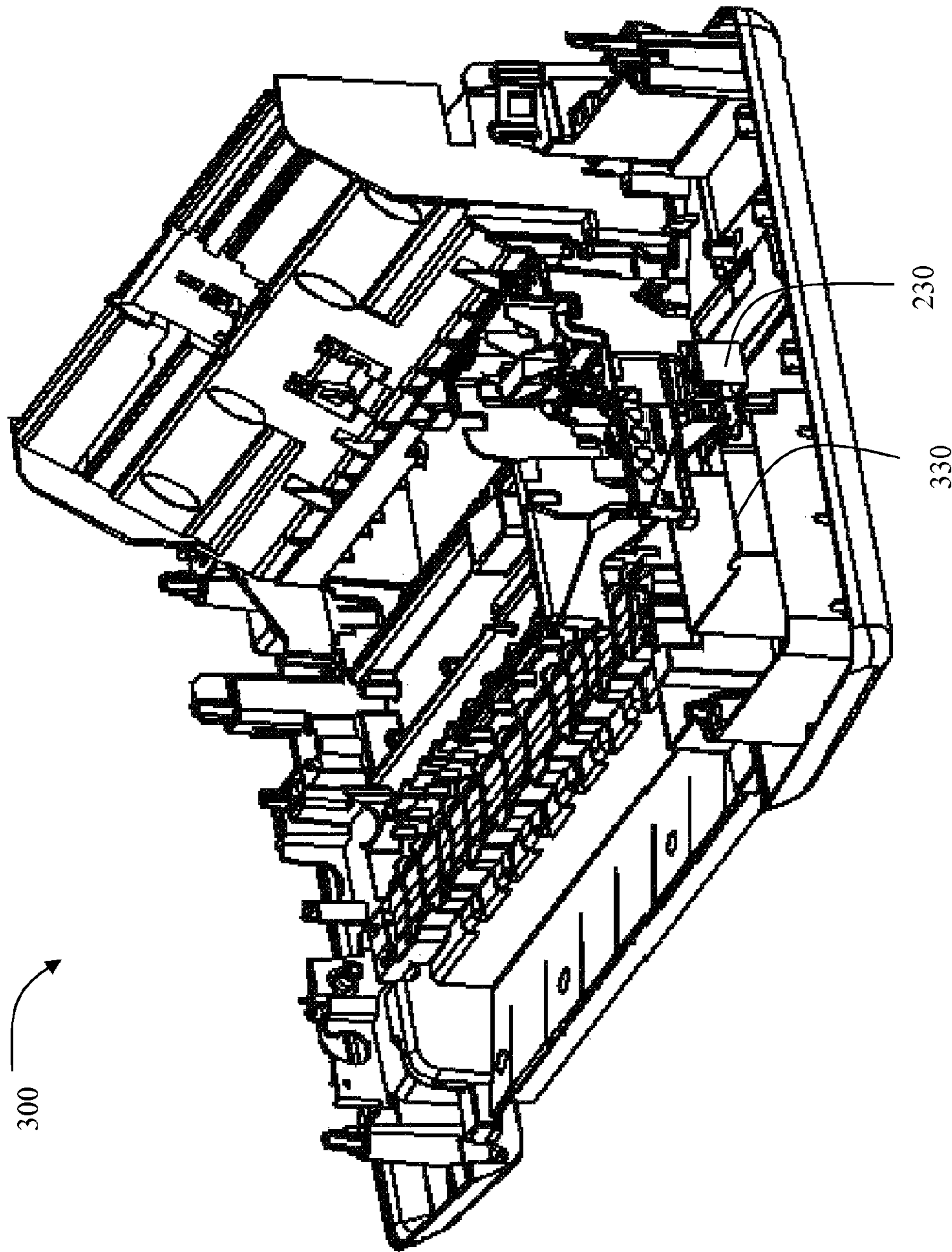


FIG. 17



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## WICKING ACCUMULATED INK AWAY FROM OPTICAL SENSOR IN INKJET PRINTER

### CROSS REFERENCE TO RELATED APPLICATION

Reference is made to commonly assigned U.S. patent application Ser. No. 13/669,493 filed Nov. 6, 2012 by Tay Swee Hwai, Kat Huat Kuu and Han Tian Phua, entitled "Ink Barrier for Optical Sensor in Inkjet Printer."

### FIELD OF THE INVENTION

The present invention generally relates to digital printing and more particularly to improving long term reliability of an apparatus used for detecting the type of print media being used in the printer.

### BACKGROUND OF THE INVENTION

In a carriage printer, such as an inkjet carriage printer, a printhead is mounted in a carriage that is moved back and forth across a region of printing. To print an image on a sheet of paper or other print medium, the print medium is advanced a given nominal distance along a media advance direction and then stopped. Media advance is typically done by a roller and the nominal distance is typically monitored indirectly by a rotary encoder. While the print medium is stopped and supported on a platen, the printhead carriage is moved in a direction that is substantially perpendicular to the media advance direction as marks are controllably made by marking elements on the print medium—for example by ejecting drops from an inkjet printhead. The position of the carriage and the printhead relative to the print medium is precisely monitored directly, typically using a linear encoder. After the carriage has printed a swath of the image while traversing the print medium, the print medium is advanced; the carriage direction of motion is reversed; and the image is formed swath by swath.

In order to produce high quality images, it is helpful to provide information to printer controller electronics regarding the printing side of the recording medium, which can include whether it is a glossy or matte-finish paper. Such information can be used to select a print mode that will provide an optimal amount of ink in an optimal number of printing passes in order to provide a high quality image on the identified media type. It is well-known to provide identifying marks or indicia, such as a bar code, on a non-printing side of the recording medium to distinguish different types of recording media. It is also well known to use a sensor in the printer to scan the indicia and thereby identify the recording medium and provide that information to the printer control electronics. U.S. Pat. No. 7,120,272, for example includes a sensor that makes sequential spatial measurements of a moving media that contains repeated indicia to determine a repeat frequency and repeat distance of the indicia. The repeat distance is then compared against known values to determine the type of media present.

U.S. Pat. No. 8,033,628 discloses the use of a backside media sensor to read a manufacturer's code for identifying the media type. In this approach light from a light source is reflected from the backside of the media and received in a photosensor while the print media is being advanced past the photosensor. A source of unreliability in interpreting the signals is that media can slip during its advance past the photosensor.

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Identification of media type by using transmitted light to detect a manufacturer's code, such as a bar code, has been disclosed in U.S. Pat. No. 8,282,183. In this approach, an optical sensor is provided on the carriage and a light source is provided on an opposite side of the media path so that the optical sensor on the carriage detects light transmitted through the print medium. This approach works well, and is especially useful in so-called L-path printers, where the print side of the print medium faces outward in the media input tray. However, it is found that if a viewing hole for the optical sensor is provided at the bottom of the carriage, accumulated ink at the bottom of the carriage can obstruct the viewing hole in some conditions after long-term usage of the printer.

Consequently, a need exists for a way to keep the optical path to a carriage-mounted sensor unobstructed by ink accumulation.

### SUMMARY OF THE INVENTION

The present invention is directed to overcoming one or more of the problems set forth above. Briefly summarized, according to one aspect of the invention, the invention resides in an inkjet printer comprising: an inkjet printhead including a printhead die having an array of nozzles; a media advance system for moving recording medium along a media path toward a print region; a carriage for moving the inkjet printhead back and forth across the print region, wherein the carriage includes: a holding receptacle for the inkjet printhead, the holding receptacle including a bottom portion having an opening into which the printhead die extends; an optical sensor; and a viewing hole in the bottom portion of the holding receptacle, the viewing hole providing an optical pathway between the optical sensor and a portion of the media path; and a wick configured to contact the bottom portion of the holding receptacle proximate the viewing hole for removing accumulated ink.

### BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features, and advantages of the present invention will become more apparent when taken in conjunction with the following description and drawings wherein identical reference numerals have been used, where possible, to designate identical features that are common to the figures, and wherein:

FIG. 1 is schematic representation of an inkjet printer system;

FIG. 2 is a perspective of a printhead;

FIG. 3 is a perspective of an L-path carriage printer;

FIG. 4 is a block diagram illustrating the flow of the print media through the printing process of the L-shaped paper path;

FIG. 5 is a perspective of a holding receptacle portion of a carriage of the printer;

FIG. 6 is a perspective of a printhead mounted onto the carriage of FIG. 5;

FIG. 7 is a perspective of an ink tank loaded into the printhead of FIG. 6;

FIG. 8 is a bottom perspective of the carriage and printhead;

FIG. 9 is an enlarged view of a portion of FIG. 8;

FIGS. 10A and 10B illustrate two different types of print media with correspondingly different bar codes;

FIG. 11 is a bottom perspective of carriage including a barrier around a viewing hole, according to an embodiment of the invention;

FIG. 12 is an enlarged view of a portion of FIG. 11;



FIG. 13 is a side perspective of the carriage and barrier of FIG. 11;

FIG. 14 is an enlarged view of a portion of FIG. 13;

FIG. 15 is a side perspective of a wick in contact with a bottom portion of the carriage according to an embodiment of the invention;

FIG. 16 is a front perspective of the wick and carriage of FIG. 15; and

FIG. 17 is a perspective of the wick mounted near the maintenance station in a printer chassis.

#### DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, a schematic representation of an inkjet printer system 10 is shown, for its usefulness with the present invention and is fully described in U.S. Pat. No. 7,350,902, and is incorporated by reference herein in its entirety. The inkjet printer system 10 includes an image data source 12, which provides data signals that are interpreted by a controller 14 as being commands to eject drops. The controller 14 includes an image processing unit 15 for rendering images for printing, and outputs signals to an electrical pulse source 16 of electrical energy pulses that are inputted to an inkjet printhead 100, which includes at least one inkjet printhead die 110. The controller 14 also includes identification processing for comparing an identified type of media to stored media types in memory 21, as will be discussed in detail hereinbelow.

In the example shown in FIG. 1, there are two nozzle arrays 120 and 130. Nozzles 121 in the first nozzle array 120 have a larger opening area than nozzles 131 in the second nozzle array 130. In this example, each of the two nozzle arrays 120, 130 has two staggered rows of nozzles 121, 131, each row having a nozzle density of 600 per inch. The effective nozzle density then in each nozzle array 120, 130 is 1200 per inch (i.e.  $d=1/1200$  inch in FIG. 1). If pixels on a recording medium 20 were sequentially numbered along the paper advance direction, the nozzles 121 or 131 from one row of the nozzle array 120, 130 would print the odd numbered pixels, while the nozzles 121 or 131 from the other row of the nozzle array 120, 130 would print the even numbered pixels.

In fluid communication with each nozzle array 120 and 130 is a corresponding ink delivery pathway 122 and 132. The ink delivery pathway 122 is in fluid communication with the first nozzle array 120, and the ink delivery pathway 132 is in fluid communication with the second nozzle array 130. Portions of the ink delivery pathways 122 and 132 are shown in FIG. 1 as openings through a printhead die substrate 111. One or more inkjet printhead die 110 will be included in the inkjet printhead 100, but for greater clarity only one inkjet printhead die 110 is shown in FIG. 1. The inkjet printhead die 110 are arranged on a mounting support member as discussed below relative to FIG. 2. In FIG. 1, a first fluid source 18 supplies ink to the first nozzle array 120 via the ink delivery pathway 122, and a second fluid source 19 supplies ink to the second nozzle array 130 via the ink delivery pathway 132. Although distinct fluid sources 18 and 19 are shown, in some applications it can be beneficial to have a single fluid source supplying ink to both the first nozzle array 120 and the second nozzle array 130 via ink delivery pathways 122 and 132, respectively. Also, in some embodiments, fewer than two or more than two nozzle arrays 120 and 130 can be included on the inkjet printhead die 110. In some embodiments, all nozzles 121 and 131 on inkjet printhead die 110 can be the same size, rather than having multiple sized nozzles on the inkjet printhead die 110.

The drop forming mechanisms associated with the nozzles 121 and 131 are not shown in FIG. 1. Drop forming mechanisms can be of a variety of types, some of which include a

heating element to vaporize a portion of ink and thereby cause ejection of a droplet, or a piezoelectric transducer to constrict the volume of a fluid chamber and thereby cause ejection, or an actuator which is made to move (for example, by heating a bi-layer element) and thereby cause ejection. In any case, electrical pulses from the electrical pulse source 16 are sent to the various drop ejectors according to the desired deposition pattern. In the example of FIG. 1, droplets 181 ejected from the first nozzle array 120 are larger than droplets 182 ejected from the second nozzle array 130 due to the larger nozzle opening area. Typically other aspects of the drop forming mechanisms (not shown) associated respectively with the nozzle arrays 120 and 130 are also sized differently in order to optimize the drop ejection process for the different sized drops. During operation, droplets of ink are deposited on the recording medium 20 (also sometimes called paper, print medium or medium herein).

FIG. 2 shows a perspective of a portion of a printhead 250, which is an example of the inkjet printhead 100. The printhead 250 includes two printhead die 251 (similar to inkjet printhead die 110 of FIG. 2) that are affixed to a common mounting support member 255. Each printhead die 251 contains two nozzle arrays 253, so that printhead 250 contains four nozzle arrays 253 altogether. The four nozzle arrays 253 in this example can each be connected to separate ink sources. Each of the four nozzle arrays 253 is disposed along a nozzle array direction 254, and the length of each nozzle array 253 along the nozzle array direction 254 is typically on the order of 1 inch or less. Typical lengths of recording media are 6 inches for photographic prints (4 inches by 6 inches) or 11 inches for paper (8.5 by 11 inches). Thus, in order to print a full image, a number of swaths are successively printed while moving the printhead 250 across the recording medium 20. Following the printing of a swath, the recording medium 20 is advanced along a media advance direction 304 that is substantially parallel to the nozzle array direction 254.

Also shown in FIG. 2 is a flex circuit 257 to which the printhead die 251 are electrically interconnected, for example, by wire bonding or TAB bonding. The interconnections are covered by an encapsulant 256 to protect them. The flex circuit 257 bends around a side of the printhead 250 and connects to a connector board 258. When the printhead 250 is mounted into a carriage 200 (see FIG. 5), the connector board 258 is electrically connected to a connector 244 on the carriage 200 so that electrical signals can be transmitted to the printhead die 251.

FIG. 3 shows a perspective of portion of a desktop carriage printer and FIG. 4 shows a schematic side view. Some of the parts of the printer have been hidden in the view shown in FIG. 3 so that other parts can be more clearly seen. A printer chassis 300 includes a horizontal base 302. The carriage 200 is moved back and forth in carriage scan direction 305, between a right side 306 and a left side 307 of the printer chassis 300, while ink drops 430 are ejected from the printhead die 251 on the printhead 250 that is mounted on the carriage 200. The carriage 200 plus the printhead 250 and other components mounted on the carriage 200 is sometimes called a carriage assembly herein. A carriage motor (not shown) moves the carriage 200 along a carriage guide rail 382. An encoder sensor 381 is mounted on the carriage 200 and indicates location of the carriage 200 relative to a linear encoder (not shown). In other words, during times when the carriage 200 is moving in the carriage scan direction 305 and the recording medium 20 (see FIG. 1) is not moving, the relative position of the carriage 200 and the recording medium 20 is directly monitored. Likewise, the position of components affixed to the carriage 200 (including an optical



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sensor 425 described below) relative to the recording medium 20 are also directly monitored by use of the encoder sensor 381.

The printhead 250 is mounted in the carriage 200, and a multi-chamber ink supply 262 and a single-chamber ink supply 264 are mounted in the printhead 250. The mounting orientation of the printhead 250 is rotated relative to the view in FIG. 2 so that the printhead die 251 are located at the bottom side of printhead 250; the droplets of ink are ejected downward in the view of FIGS. 3 and 4. The multi-chamber ink supply 262, for example, contains three ink sources: e.g. cyan, magenta, and yellow ink; while the single-chamber ink supply 264 contains black ink. Toward the right side 306 of the printer chassis 300, in the example of FIG. 3, is a maintenance station 330.

In the L-shaped paper path shown in FIGS. 3 and 4, the recording medium 20 is loaded along a paper load entry direction 301 nearly vertically at an angle of sixty degrees or more relative to the horizontal base 302 against a media input support 320 at a rear 309 of the printer chassis 300. Several rollers are used to advance the recording medium 20 through the printer. A pick roller 321 on a pick arm assembly 352 is rotated to move a first piece or sheet 371 of a stack 370 of paper or other types of recording medium 20 in the media input support 320 from the paper load entry direction 301 to the media advance direction 304. The paper is then moved by a feed roller 312 and idler roller(s) 323 to advance toward the print region 303 (disposed along the carriage scan direction 305). The feed roller 312 is driven directly by a paper advance motor (not shown) that is connected by belt or gear engagement, for example at a drive gear 314. After the image is printed at the print region 303, the sheet 371 of the stack 370 is further advanced to a discharge roller 324 and star wheel(s) 325.

The print region 303 is defined as the region along the pathway of the carriage 200 as it moves the printhead 250 in its carriage scan direction 305. In many printers, particularly those that are configured to print borderless prints of photographic images, for example, an absorbent material 400 (FIG. 4) spans a predetermined length of the printer chassis 300. The absorbent material 400 functions as a collector for absorbing superfluous ink mist or oversprayed ink present in the print region 303. A media support, which can include support ribs or pins 405, protrudes through the absorbent material 400 for providing a surface on which the paper rests during printing and during scanning of the paper type. As defined herein, "media support" is defined as a support mechanism which functions primarily or entirely to support a print medium, such as paper and the like, during a stage of printing. The pins 405 are preferably disposed in a plurality of rows at predetermined locations relative to standard widths of print media, so that during borderless printing, ink that is oversprayed beyond the edges of the print medium lands primarily on the absorbent material 400, rather than on the pins 405.

FIG. 5 is a perspective of the carriage 200. The carriage 200 includes a holding receptacle 202 for an inkjet printhead 250 (see FIGS. 2, 6-7). The holding receptacle 202 includes a first side wall 208 and a second side wall 209 opposite the first side wall 208. The first side wall 208 and the second side wall 209 extend from a bottom portion 205 of the holding receptacle 202. The bottom portion 205 includes an opening 204 into which the printhead die 251 extend when the printhead 250 is mounted onto the carriage 200 (FIG. 8). In the example shown in FIG. 5, the bottom portion 205 includes a first flap 206 extending between the first side wall 208 and the opening 204, and a second flap 207 extending between the second side

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wall 209 and the opening 204. The carriage 200 includes one or more bushings 201 to glide along the carriage guide rode 382 (FIG. 3) in the carriage scan direction 305. The carriage 200 also includes a connector 244 to mate with the connector board 258 of the printhead 250 (FIG. 2).

FIGS. 6 and 7 are perspectives of the printhead 250 mounted in the carriage 200. The printhead 250 includes a compartment 272 for the multi-chamber ink supply 262 (FIG. 3) and a compartment 274 for the single chamber ink supply 264. Ink ports 271 receive ink from the ink supplies 262 and 264 and provide the ink to the printhead die 251 of the printhead 250. FIG. 7 shows a perspective of the multi-chamber ink supply 262 loaded into the compartment 272 of the printhead 250.

FIG. 8 is a bottom perspective of the carriage 200 and the printhead 250 with the printhead die 251 extending into the opening 204, and FIG. 9 is an enlarged view of a portion of this region. The optical sensor 425 is mounted near the first side wall 208. A viewing hole 210 in the bottom portion 205 of the holding receptacle 202 provides an optical pathway for the optical sensor 425. In particular, the viewing hole 210 is disposed in the first flap 206. In the enlarged view of FIG. 9 it can be seen that the viewing hole 210 includes a narrow aperture slot 211 that blocks stray light from entering the optical sensor 425, thereby improving its signal to noise ratio.

Referring to FIG. 4, a platen 420 forms a foundation in which the absorbent material 400 is disposed. One or more light sources 410 are disposed proximate the absorbent material 400 for illuminating the sheet 371 as it passes below the carriage 200. When the sheet 371 is below the carriage 200, the light passes through the sheet 371, through the slot 211 and the viewing hole 210 (FIGS. 8-9) and into the optical sensor 425, which is attached to the carriage 200, for sensing the light transmitted through the sheet 371. In other words, the viewing hole 210 and the slot 211 provide an optical pathway between the optical sensor 425 and a portion of the media path. The one or more light sources 410 are disposed on a first side of the portion of the media path (below sheet 371 in FIG. 4) and the carriage 200 and the optical sensor 425 are disposed on a second side of the portion of the media path (above sheet 371 in FIG. 4) opposite the first side. A media identification code, such as a bar code or the like, is provided on the non-print side of the sheet 371 (the surface facing the light source 410) so that the sheet 371 can be identified via the transmitted light which is sensed by the optical sensor 425. During printing, the carriage 200 traverses back and forth across the print region 303 via the carriage guide rail 382 to position the printhead die 251 to eject ink drops 430 for printing onto the printing surface (surface facing the carriage 200) of the sheet 371 at precise locations determined by the image data and the position of the carriage 200 determined from the signals from encoder sensor 381 (see FIG. 3). During a prior step of media identification, the carriage 200 is guided by the carriage guide rail 382 to permit the optical sensor 425 to sense the transmitted light including the bar code pattern, while the relative position of the optical sensor 425 (being mounted on the carriage 200), is directly monitored by the encoder sensor 381, as described above relative to FIG. 3. In this manner, the printer is able to identify the particular type of media being used so that it can make any adjustments suitable for that particular media prior to printing.

FIGS. 10A and 10B show schematic representation of markings on the backside of a first media type 221 of recording medium and a second media type 222 of recording medium respectively. In this embodiment, each of the various types of recording media has a reference marking consisting of a pair of "anchor bars" 225 and 226 which are located at a



fixed distance with respect to one another for all media types. In addition, there is a first identification mark **228** on the first media type **221** in FIG. **10A**, and there is a second identification mark **229** on the second media type **222** in FIG. **10B**. In this example, the first identification mark **228** is spaced a distance  $s_1$  away from the anchor bar **226** on first media type **221**, and the second identification mark **229** is spaced a distance  $s_2$  away from anchor bar **226** on the second media type **222**, such that  $s_1$  does not equal  $s_2$ . Thus in this example, it is the spacing of the identification mark from one of the anchor bars **225** and **226** that identifies the particular type of recording medium.

Ovals in FIG. **10A** schematically represent successive fields of view **240** of the optical sensor **425** as the carriage **200** is scanned relative to the first media type **221** along the carriage scan direction **305**. Because the field of view **240** of the optical sensor **425** moves along the carriage scan direction **305** as the carriage **200** moves, it is actually the projections of marking spacings  $s_1$  and  $s_2$  along the carriage scan direction **305** that are measured. Optical sensor data is sampled much more frequently than the fields of view **240** in FIG. **10A** show, but only a few samples are shown for clarity. In addition, the actual field of view **240** can be a different size or shape than the ovals shown in FIG. **10A**, as determined, for example by aperture shape (such as slot **211**), the angle of the aperture plane relative to the plane of the recording medium, optical elements such as lenses, and optical path lengths.

The output signal of the optical sensor **425** can be amplified and filtered to reduce background noise and then digitized in an analog to digital converter. Once the amplified signal has been digitized, digital signal processing can be used to further enhance the signal relative to high frequency background noise. In addition, the time-varying signal can be converted into spatial distances to find peak widths or distances between peaks corresponding to the code pattern markings. Processed signal patterns are sent to a processor (for example a processor in the controller **14** of FIG. **1**) and analyzed by comparing to signal patterns stored in memory **21** (see FIG. **1**) to indicate media type.

In the examples shown in FIGS. **10A** and **10B**, the bar codes extend across the recording medium and are repeated a plurality of times on the recording medium. This configuration can be advantageous for the manufacturer of the recording medium in that recording media is typically manufactured in large rolls that are subsequently cut to size. If the bar code extends as in FIGS. **10A** and **10B** it can be applied while the recording medium is still in the large roll format, and cut to whatever size is required. Smaller bar codes that are positioned with respect to a particular edge or corner of the recording medium are not as easily provided.

A problem that can occur in the carriage configuration shown in FIGS. **8** and **9** is that after long-term usage of the printhead **250**, ink can accumulate on the bottom portion **205** of the holding receptacle **202** and flow across the first flap **206** into the viewing hole **210** and obstruct the optical pathway between optical sensor **425** and sheet **371** (FIG. **4**) of recording medium. If the viewing hole **210** includes a small aperture, such as narrow slot **211** (FIG. **9**), a relatively small amount of accumulated ink can decrease the signal from the optical sensor **425**, thereby impacting the reliability of media type detection.

A first way of improving the long-term reliability of media type detection, according to embodiments shown in FIGS. **11-14** is provided by forming a barrier **212** that projects from the bottom portion **205** of the holding receptacle **202** between the opening **204** and the viewing hole **210** for impeding the flow of ink toward viewing hole **210** and aperture slot **211**.

FIG. **11** is a bottom perspective of the carriage **200** including the barrier **212**, and FIG. **12** is an enlarged view of a portion of FIG. **11**. FIG. **13** is a side perspective of the carriage **200** including the barrier **212**, and FIG. **14** is an enlarged view of a portion of FIG. **13**. In the example shown in FIGS. **11-14**, the barrier **212** is curved such that it has a first end **213** at first side wall **208**, a second end **214** at the first side wall **208** and an intermediate portion **215** that is closer to the opening **204** than the first end **213** or the second end **214** (see FIG. **12**). In other words, the barrier **212** is open at the first side wall **208**. As shown in FIGS. **13** and **14**, the barrier **212** projects from the bottom portion **205** of the holding receptacle **202** in a first direction **216**, and first side wall **208** extends from bottom portion **205** in a second direction **217** opposite the first direction **216**. The barrier **212** and the viewing hole **210** can be formed by injection molding at the same time the carriage **200** is injection molded.

A second way of improving the long-term reliability of media type detection, according to an embodiment shown in FIGS. **15-17** is provided by a wick **230** that is configured to contact the bottom portion **205** of the holding receptacle **202** near the viewing hole **210** for removing accumulated ink. FIG. **15** shows a side perspective and FIG. **16** shows a front perspective of the wick **230** in contact with the bottom portion **205** near the first side wall **208**. In FIG. **17**, the wick **230** is mounted near the maintenance station **330** (see also FIG. **3**) in the printer chassis **300**.

In the embodiment shown in FIGS. **15-17**, the wick **230** is formed from a flexible sheet of capillary medium such as felt or foam. The wick **230** has a first fold **233** and a second fold **234**. The first fold **233** is located between a base **235** of the wick **230** and a first leg **231** of the wick **230**. The base **235** is substantially parallel to the bottom portion **205** of the holding receptacle **202** of the carriage **200**. The first leg **231** has a first end **236** disposed at a first height  $h_1$  above the base **235**. The bottom portion **205** of the holding receptacle **202** of the carriage **200** is located a distance above the base **235** that is less than or equal to first height  $h_1$ , so that when the carriage **200** is moved to a position near the maintenance station **330**, the first end **236** of the first leg **231** of the wick **230** contacts and wipes the bottom portion **205** of the holding receptacle **202** to remove accumulated ink near viewing hole **210** (FIG. **12**). The position of the first leg **231** is typically such that the printhead die **251** (FIG. **8**) is not contacted by the wick **230**. The second fold **234** is located between the base **235** and a second leg **232**. The second leg **232** has a second end **237** disposed at a second height  $h_2$  above the base **235**. The second height  $h_2$  is greater than first height  $h_1$ .

The second leg **232** is not intended to contact the bottom portion **205** of the carriage **200**. Rather, the second leg **232** provides a large area for evaporation of volatile ink components from the ink absorbed by the wick **230**.

The invention has been described in detail with particular reference to certain preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

## PARTS LIST

- 10** Inkjet printer system
- 12** Image data source
- 14** Controller
- 15** Image processing unit
- 16** Electrical pulse source
- 18** First fluid source
- 19** Second fluid source
- 20** Recording medium



21 Memory  
 100 Inkjet printhead  
 110 Inkjet printhead die  
 111 Substrate  
 120 First nozzle array  
 121 Nozzle(s)  
 122 Ink delivery pathway (for first nozzle array)  
 130 Second nozzle array  
 131 Nozzle(s)  
 132 Ink delivery pathway (for second nozzle array)  
 181 Droplet(s) (ejected from first nozzle array)  
 182 Droplet(s) (ejected from second nozzle array)  
 200 Carriage  
 201 Bushing  
 202 Holding receptacle  
 204 Opening  
 205 Bottom portion (of holding receptacle)  
 206 First flap  
 207 Second flap  
 208 First side wall  
 209 Second side wall  
 210 Viewing hole  
 211 Slot  
 212 Barrier  
 213 First end (of barrier)  
 214 Second end (of barrier)  
 215 Intermediate portion  
 216 First direction  
 217 Second direction  
 221 First type recording medium  
 222 Second type recording medium  
 225 First bar of anchor bar pair  
 226 Second bar of anchor bar pair  
 228 Identification mark for first type recording medium  
 229 Identification mark for second type recording medium  
 230 Wick  
 231 First leg  
 232 Second leg  
 233 First fold  
 234 Second fold  
 235 Base (of wick)  
 236 First end (of first leg)  
 237 Second end (of second leg)  
 240 Field of view  
 244 Connector  
 250 Printhead  
 251 Printhead die  
 253 Nozzle array  
 254 Nozzle array direction  
 255 Mounting support member  
 256 Encapsulant  
 257 Flex circuit  
 258 Connector board  
 262 Multi-chamber ink supply  
 264 Single-chamber ink supply  
 271 Ink ports  
 272 Compartment  
 274 Compartment  
 300 Printer chassis  
 301 Paper load entry direction (for L path)  
 302 Horizontal base (of printer)  
 303 Print region  
 304 Media advance direction  
 305 Carriage scan direction  
 306 Right side of printer chassis  
 307 Left side of printer chassis  
 309 Rear of printer chassis

312 Feed roller  
 314 Gear drive  
 320 Media input support  
 321 Pick roller  
 5 323 Idler roller  
 324 Discharge roller  
 325 Star wheel(s)  
 330 Maintenance station  
 352 Pick arm assembly  
 10 370 Stack of media  
 371 Sheet  
 381 Encoder sensor  
 382 Carriage guide rail  
 15 400 Absorbent material  
 405 Support pins  
 410 Light source  
 420 Platen  
 425 Optical sensor  
 20 430 Ink drops

The invention claimed is:

1. An inkjet printer comprising:

an inkjet printhead including a printhead die having an  
 25 array of nozzles;  
 a media advance system for moving recording medium  
 along a media path toward a print region;  
 a carriage for moving the inkjet printhead back and forth  
 across the print region, wherein the carriage includes:  
 30 a holding receptacle for the inkjet printhead, the holding  
 receptacle including a bottom portion having an open-  
 ing into which the printhead die extends;  
 an optical sensor; and  
 a viewing hole in the bottom portion of the holding  
 35 receptacle, the viewing hole providing an optical  
 pathway between the optical sensor and a portion of  
 the media path; and  
 a wick configured to contact the bottom portion of the  
 holding receptacle distal to the printhead die which  
 40 extends into the opening so that the wick does not con-  
 tact the printhead and proximate the viewing hole for  
 removing accumulated ink.

2. The inkjet printer of claim 1, wherein the wick includes  
 at least one fold.

45 3. The inkjet printer of claim 2, wherein the wick includes:  
 a base disposed substantially parallel to the bottom portion  
 of the holding receptacle of the carriage; and  
 a first leg having a first end disposed at a first height above  
 the base, wherein the bottom portion of the holding  
 50 receptacle of the carriage is located a distance above the  
 base that is less than or equal to the first height.

4. The inkjet printer of claim 3, wherein the wick further  
 includes a second leg having a second end disposed at a  
 second height above the base.

55 5. The inkjet printer of claim 4, wherein the second height  
 of the second end of the second leg is greater than the first  
 height of the first end of the first leg of the wick.

6. The inkjet printer of claim 1 further comprising a main-  
 tenance station, wherein the wick is disposed proximate the  
 60 maintenance station.

7. The inkjet printer of claim 1 further comprising a light  
 source disposed on a first side of the portion of the media path,  
 wherein the carriage is disposed on a second side of the  
 portion of the media path opposite the first side.

65 8. The inkjet printer of claim 1 further comprising a con-  
 troller for analyzing signals from the optical sensor for iden-  
 tifying a type of recording medium.

9. The inkjet printer of claim 1, the carriage further including a first side wall extending from the bottom portion of the holding receptacle, wherein the optical sensor is disposed proximate the first side wall.

10. The inkjet printer of claim 9, the carriage further including a second side wall extending from the bottom portion of the holding receptacle opposite the first side wall. 5

11. The inkjet printer of claim 10, wherein the bottom portion of the holding receptacle includes:

a first flap extending between the first side wall and the opening; and 10

a second flap extending between the second side wall and the opening.

12. The inkjet printer of claim 11, wherein the viewing hole is disposed in the first flap. 15

13. The inkjet printer according to claim 1, wherein the viewing hole includes a slot.

\* \* \* \* \*